

30. (Newly Added) The fuse box of Claim 29, wherein the roll of the fuses includes a flexible carrier strip having a plurality of indexing apertures, wherein the indexing apertures are individually associated with one of the fuses.

31. (Newly Added) The fuse box of Claim 28, wherein the fuses individually include an insulative substrate, a metallization pattern disposed on the substrate and a protective coating covering at least a portion of the metallization pattern.

32. (Newly Added) The fuse box of Claim 28, wherein the plurality of fuses are positioned on a substrate so as to mate with a terminal arrangement defined by the common bus terminal.

Sub 334 33. (Newly Added) The fuse box of Claim 28, wherein the fuses are axial fuses.

REMARKS

Claims 1 to 7 and 19 to 25 were previously pending in this application. Claims 1, 3, 5, 6, 19, 21, 22 and 25 were rejected as being anticipated under 35 U.S.C. § 102(b) by U.S. Patent No. 5,618,209 B1 to Lin et al. ("*Lin*"). Claims 4 and 7 were rejected as being obvious under 35 U.S.C. § 103(a) in view of *Lin*. Claim 24 was rejected as being obvious under 35 U.S.C. § 103(a) in view of *Lin* and U.S. Patent No. 5,027,101 B1 to Morrill, Jr. ("*Morrill*").

The specification and drawings have been amended in various places for purposes of clarity and readability. Claims 6 and 25 have also been amended for clarification purposes and have not been amended for any reason related to patentability under 35 U.S.C. §§ 101, 102 or 103. Applicants do not intend to disclaim any subject matter in view of any of the amendments. In addition, newly submitted Claims 28 to 33 have been added. None of these amendments or new claims add or claim new matter.

Applicants respectfully traverse the rejection of Claims 1, 3, 5, 6, 19, 21, 22 and 25 as being anticipated by *Lin*. In this regard the cited reference fails to disclose each and every chemical element. For instance, Claim 1 of Applicants' invention includes the limitation, "a wiring terminal having a plurality of discrete circuits extending therefrom." This element is not disclosed or suggested by *Lin*. The Detailed Action asserts that the wiring terminal of *Lin* has a

plurality of circuits extending therefrom. Page 2 of the Detailed Action states, "As per Claim 1, Lin et al (hereafter Lin) teach[es] a fuse arrangement for a vehicle (Figure 4) comprising a wiring terminal (7) having a plurality of discrete circuits extending therefrom".

Applicants respectfully submit that *Lin* does not disclose a wiring terminal (7) having a plurality of discrete circuits extending therefrom. Figure 4 of *Lin* clearly illustrates a single conductor extending from each terminal 7. Indeed, at col. 1, lines 13 to 21, *Lin* states:

a plurality of tightening-up screws 63 and 73 respectively fastened to the fuse connector 6 and the terminal blocks to hold down conductors, a plurality of curved metal spring plates 61 and 71 respectively fixed to the fuse connector 6 and the terminal blocks 7 by screws 62 and 72, and a plurality of cartridge fuses 8 connected between the curved metal spring plates 61 on the fuse connector 6 and the metal spring plates 71 on the terminal blocks 7. [emphasis added]

The disclosure of *Lin* is therefore consistent with Figure 4, which clearly shows a plurality of terminals 7 and a single conductor for each terminal. Figure 4 of *Lin* does not therefore teach a wiring terminal having a plurality of discrete circuits extending therefrom, as included in Claim 1 of the Applicant's application.

In addition to the disclosure in connection with Figure 4, Figures 1 and 2A of *Lin* clearly show terminals 2 and only a single, discrete conductor 41 extending from each terminal 2. At col. 2, lines 16 to 18, *Lin* states:

A plurality of terminal blocks 2 are respectively mounted in the horizontal holes 13 to hold a respective conductor 41 by a respective tightening-up screw 23. [emphasis added]

The wiring terminals of *Lin* are therefore clearly taught to house or hold only a single discrete wire or conductor. *Lin* does not teach or suggest using a single terminal or terminal block to connect to or house a plurality of conductors or circuits as included in Claim 1. For this reason, Applicants' Claim 1, and Claims 2 through 7 that depend therefrom, are each patentably distinguishable over *Lin*.

Claims 1 and 19 also both include the limitation of a "common bus terminal." The common bus terminal of the present invention makes a single connection to a positive vehicle voltage B+ of the voltage battery (see, e.g., specification page 8, lines 13 to 15; page 10, lines 6 to 10; and page 10, lines 24 to 27). The common bus terminal of the present invention also connects to at least one and most likely to a plurality of fuses (see specification Figs. 3, 4 and 5).

The common bus terminal provides a number of advantages over the prior art. As discussed at page 9, line 16 of the specification:

It will be appreciated that the singular common bus terminal 46 enables ease of connection of the voltage B+ to a group or all of the fuses 48 within the fuse box 40. Additionally, this arrangement affords quick connection or disconnection of the fuses from the battery voltage B+. Moreover, the arrangement of the present embodiment creates separation of the voltage supply terminal (i.e., the common bus terminal 46) from the terminals 53 that supply the loads within the vehicle. Thus, the heat generated at the terminals 49 of the fuses when current flows through the fuses 48 is more easily and efficiently dissipated

Lin does not teach or suggest a common bus terminal as included in Claims 1 and 19. It is asserted at page 2 of the Detailed Action that a fuse connector (6) of Figure 4 of *Lin* discloses the common bus terminal as defined and disclosed in Applicants' invention. *Lin* does not disclose that the fuse connector 6 electrically couples to a positive voltage source B+. Indeed, *Lin* does not disclose to what the terminals of the drawings connect. Thus, *Lin* does not teach or suggest the common bus terminal of Applicants' invention, which is clearly defined in each embodiment to electrically couple to the positive voltage terminal of an automobile battery.

In *Lin*, the fuse connector 6 (which is analogous to the fuse connector 3 shown in connection with Figures 1 and 2A) actually teaches away from the common bus terminal of Applicants' invention because *Lin* shows three conductors 36 exiting the fuse connector 3 (Figures 1 and 2A) and three conductors exiting the connector 6 of Figure 4. At col. 2, lines 28 to 34, *Lin* on the contrary states:

A plurality of metal sockets 31 are respectively fixed to the fuse connector 3 by a respective screw 32 to hold the opposite ends of the cartridge fuses 4. When conductors 36 are respectively inserted into the wire holes 34, they are respectively connected to the metal sockets 31

Lin therefore clearly discloses connecting each conductor, i.e., a plurality of conductors within the fuse connector 3, to a separate and distinct fuse.

Applicants' invention advantageously only includes one conductor connecting to the positive voltage terminal B+ of the automobile battery. Figures 3, 4 and 5 of the Applicants' invention disclose that the common bus terminal advantageously supplies power to a plurality of or to all of the fuses in the fuse box, and Claims 1 and 19 include the limitation of a common bus terminal.

Anticipation requires the disclosure in a single prior art reference of each element of the claim under consideration. W.L. Gore and Assoc. v. Garlock, Inc., 220 U.S.P.Q. 303, 313 (Fed. Cir. 1983), cert. denied, 469 U.S. 851 (1984). Because *Lin* does not teach or suggest the common bus terminal of Applicants' claimed invention, Applicants respectfully submit that independent Claims 1 and 19 and Claims 2 through 7 and 20 through 25 that respectively depend therefrom are each patentably distinguishable over the art of record.

It should also be appreciated that because *Lin* does not teach or suggest the common bus terminal of Claim 1, *Lin* does not teach or suggest ". . . a common bus having a plurality of fuse terminal connections . . ." as included in Claim 5 or ". . . at least one fuse disposed between the wiring terminal and the common bus assembly" as included in amended Claim 6. Further, because *Lin* does not teach the common bus terminal of Claim 19, *Lin* does not teach or suggest ". . . wherein the common bus terminal is affixed to the base," as included in Claim 22 or ". . . wherein the common bus terminal further comprises a plurality of contact terminals . . ." as included in Claim 25. Accordingly, Applicants respectfully submit that dependent Claims 5, 6, 22 and 25 are each independently patentably distinguishable over *Lin*.

In summary, *Lin* does not teach or suggest each limitation contained in independent Claims 1 and 19, therefore, Claims 1 and 19 and Claims 2 to 7 and 20 to 25 are each patentably distinguishable over the art of record.

Claims 4 to 7 were rejected as being obvious under 35 U.S.C. §103(a) over *Lin*. Claim 24 was rejected as being obvious under 35 U.S.C. § 103(a) in view of *Lin* and *Morrill*. As stated above, Applicants' submit that independent Claims 1 and 19 are patentably distinguished over the art of record. Therefore, it is unnecessary to further distinguish dependent Claims 4 to 7 and 24 over *Lin* and *Morrill*, and Applicants respectfully request that these claims be deemed allowable at this time. Claims 28 to 33 have been added and should be deemed allowable for at least the above-explained reasons.

For the foregoing reasons, Applicants respectfully request reconsideration of their application and earnestly solicit an early allowance of same.

Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attached page is captioned "**Versions with Markings to Show Changes Made.**"

Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the Specification:

Paragraph beginning at line 17 of page 1 has been amended as follows:

Referring to Figure 1, a typical fuse box used in an automobile is illustrated. The fuse box 10 is typically constructed of a rigid plastic and includes a base 12 and a cover 14. The base 12 includes a number of terminals 16a and 16b ~~16~~ disposed in a bottom portion 18 of the base. These terminals are electrically connected to fuse receptacles 22 on a top portion 20 of the base.

Paragraph beginning at line 12 of page 2 has been amended as follows:

Additionally, the standard automobile fuses known in the art (e.g., see Figure 2) are manufactured as singular devices. Fuses shipped to the end user (e.g., an automobile manufacturer) are typically packaged as singulated devices that are delivered in bulk or placed within a "tube", taped together or that use other similar packaging that is convenient for the end user when inserting the fuses into the above-described fuse boxes, ~~for example~~. However, such packaging is costly and time intensive for the fuse manufacturer since the fuses must be individually separated and packaged.

Paragraph beginning at line 23 of page 2 has been amended as follows:

Furthermore, fuse boxes known in the art (e.g., see Figure 1) are designed to receive individual fuses that must be individually inserted into the fuse box. Because fuses are individually placed in the fuse box, the number of manufacturing steps ~~is~~ increase, thereby also increasing the complexity of placing and connecting the fuses in the fuse box when multiple fuses are required, ~~for example~~.

Paragraph beginning at line 5 of page 4 has been amended as follows:

In another embodiment of the invention, a fuse array is constructed with a planar insulating substrate having two planar sides. A metallization pattern is disposed on at least one side of the substrate and comprises at least one fuse element. A protective coating is disposed on the sides of the substrate and covers at least a first portion of the metallization. The construction of one or more fuses on a planar substrate affords modularity in the fuse design and allows for ~~corresponding~~ easier insertion and removal of fuses within a fuse block.

Paragraph beginning at line 15 of page 4 has been amended as follows:

In another embodiment of the invention, a packaging apparatus for vehicle fuses includes a carrier strip having at least one rail comprised of a flexible material. In addition, a plurality of fuse assemblies are integrally connected to the at least one rail, and are ~~but~~ also configured to be separable from the rail by an end user. The carrier strip is capable of being rolled to form a package for shipping to the end user. The use of a carrier strip having integral fuse assemblies and the capacity to be rolled-up for shipping reduces manufacturing steps and costs for the fuse manufacturer. Additionally, since the fuse assemblies are configured to be separable from the

rails of the carrier strip by an end user, the ease with which the end user may place and connect fuses within a fuse box, for example, can be increased.

Paragraph beginning at line 1 of page 8 has been amended as follows:

Referring now to the figures, Figure 3 is a sectional view of an exemplary fuse box arrangement according to the present invention. The fuse box, shown generally at 40, includes a base portion 42 and a cover 44. In the embodiment illustrated, within the base portion 42, is a wiring harness 52 having a plurality of terminals 53 that connect with fuses (i.e., fuses $48_1 - 48_n$, collectively referred to herein as fuses 48). The wiring harness 52 is connected to a plurality of conductors 56 that supply current to loads within a vehicle containing the fuse box 40.

Paragraph beginning at line 1 of page 15 has been amended as follows:

With both embodiments of Figures 10 and 11, the carrier strip includes indexing holes 108 and 130, respectively, that can be further used by the end user to delineate the location of the fuse assemblies 102 or 122 when being separated from the carrier strip rail. For example, in an automated separation process that separates the fuse assemblies from the rails of the carrier strip, the indexing holes 108 or 130 can engage with pegs radially projecting from a drive wheel, the pegs spaced an angular distance around the circumference of the wheel at a distance that is equal to a linear distance "d" between the indexing holes in the rails of the carrier strip. Thus, when the drive wheel has rotated through an angular distance equal to "d", a cutting operation can be performed to separate the fuse assembly from the rails of the carrier strip.

In the Claims:

Claims 6 and 25 have been amended as follows:

6. (Amended) The fuse arrangement of Claim 1, wherein the wiring terminal includes a plurality of discrete circuits that are, in turn, connected to respective electrical loads respectively protected by the at least one fuse disposed between the wiring terminal and the common bus assembly fitting.

25. (Amended) The fuse box arrangement of Claim 19, wherein the common bus terminal further comprises a plurality of contact terminals that are configured to connect to first terminals of each of the plurality of fuses within the fuse array, wherein the common bus terminal is configured to simultaneously connect all of the contact terminals ~~terminal~~ therein with the first terminals of each of the fuses when connecting the common bus terminal to the first terminals.